



National Aeronautics and
Space Administration

Advanced Life Support Systems Engineer



Fred Smith
**Advanced Life Support
Systems Engineer**

NASA Johnson Space Center

I help provide life support (food, air, water) to the astronauts on the International Space Station (ISS). In my job I utilize and develop many specialized technologies that make life possible in space. These include waste and water treatment systems, as well as working with plant growth chambers and synthetic soil production. One of my most memorable moments at work, involved spending 60 days with three other crew members in a special test chamber (affectionately known as the can), where we recycled all of our waste water and air. During this experience, what I missed most was not to be able to touch my loved ones, or to see the outside.

Areas of expertise:

- Water Recovery Urine Treatment Subsystems
- Vapor Compression Distillation Subsystems (VCDS)

How I first became interested in this profession:

Back in the fifth grade in Kansas City, where I grew up, I wanted to be a basketball player. This changed in the sixth grade. I got to visit the Kennedy Space Center, and saw a great Sci-fi movie called "Star Wars." I then decided that I wanted to work in the space industry, and one day, perhaps, to become an astronaut.

What helped prepare me for this job:

I came to NASA as a co-op in 1990. A co-op attends college one semester and works the next, then goes back to school, etc. In college I studied two separate careers: the Mechanical Engineering Degree helps me with the technical aspects of developing and testing advanced life support systems for the astronauts; the Psychology Degree is an added bonus in dealing with human response to long stays in restricted environments. As we attempt to simulate, in controlled chambers on Earth, the living conditions that astronauts will encounter in space, our primary concern will always be with their safety and well being.

My role models or inspirations:

My family and church are a great source of strength and inspiration. I once got a great deal of satisfaction in tutoring a younger student, and seeing him do better as a result. Sometimes in helping others one helps oneself, and I was motivated and inspired by this student's success.

My education and training:

- B.S. in Psychology, University of Kansas
- B.S. in Mechanical Engineering, Prairie View A & M University

My career path:

- Ten years at NASA/JSC working with physicochemical, as well as biological regenerative life support technology

What I like about my job:

There is no other job like mine! What I like best about it is to be working on technology that no one else is working on, that will go into space, and someday may help humanity reach other planets (such as Mars), and to travel through space for extended periods of time.

What I don't like about my job:

What I like least about my job is the paper work, which becomes tedious at times.

My advice to anyone interested in this occupation:

Ask lots of questions to clarify things you don't understand. Co-oping at the space center can give you the opportunity to see what type of work you may like, and to learn more about NASA.